Science Council of British Columbia

Eleventh Annual Report 1988-89

Secretariat on Science, Research and Development

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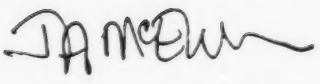
June 30, 1989

The Honourable Stanley B. Hagen,
Minister of Advanced Education and Job Training,
Minister Responsible for Science and Technology,
Province of British Columbia,
Parliament Buildings,
Victoria, B.C.
V8V 1X4

Dear Mr. Hagen:

I have the honour to present you the Eleventh Annual Report of the Science Council of British Columbia, and of the Secretariat on Science Research and Development, for the year ending March 31, 1989.

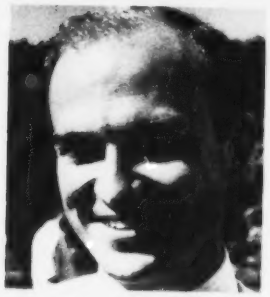
Respectfully submitted,



James A. McEwen,
Chairman,
Science Council of British Columbia

CHAIRMAN

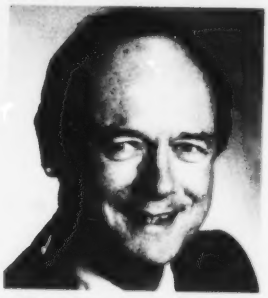
Dr. William M. Armstrong



Dr. James A. McEwen

PRESIDENT

Dr. Denis J. Connor



Mr. Graeme S. Balcom

Dr. Tom W. Calvert

Mr. Haig de B. Farris

Dr. Otto L. Forgacs

Ms. Gail S. Gabel

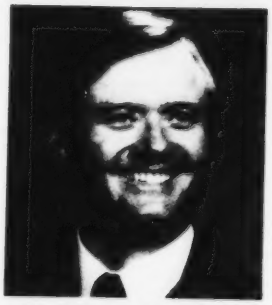
Dr. D. Val George

Mr. Ian F. Greenwood

Dr. Terry E. Howard

Dr. Peter A. Larkin

Dr. Julia Levy



Dr. Eric G. Manning

Mr. Keith V.S. Meyer

Dr. George W. Poling

MEMBERS OF THE SCIENCE COUNCIL OF BRITISH COLUMBIA

(List includes all those who served between April 1, 1988 and March 31, 1989)

Member	Date of First Appointment	Current Term Expires
Dr. James A. McEwen Director, Biomedical Engineering Vancouver General Hospital	September 18, 1986 (Chairman)	October 20, 1990
Dr. William M. Armstrong Retired Vancouver	January 29, 1982	Honorary Member
Mr. Graeme S. Balcom President Harmattan International Consulting Vancouver	March 24, 1983	September 1, 1989
Dr. Tom W. Calvert Vice President, Research and Information Systems Simon Fraser University	January 7, 1988	October 20, 1990
Dr. Denis J. Connor Vice President, Corporate Development MacDonald Dettwiler & Associates, Richmond	February 20, 1985	April 30, 1988
Mr. Haig de B. Farris Executive Vice President, Ventures West Technologies Vancouver	October 20, 1988	October 20, 1989
Dr. Otto L. Forgacs Senior Vice President, Research and Development MacMillan Bloedel Ltd. Vancouver	October 20, 1988	October 20, 1989
Mr. K. Tony French President Forintek Canada Corporation Vancouver	February 23, 1984	September 1, 1988
Ms. Gail S. Gabel Managing Director and C.E.O. Aanderaa Instruments Ltd. Victoria	January 7, 1988	October 20, 1990
Dr. D. Val George Consultant Terrace	January 7, 1988	October 20, 1990
Mr. Ian F. Greenwood Consultant Kelowna	October 20, 1988	October 20, 1989
Dr. Terry E. Howard President British Columbia Research Corporation Vancouver	July 26, 1984	September 1, 1989

Members *continued*

Member	Date of First Appointment	Current Term Expires
Dr. Peter A. Larkin University Professor University of British Columbia Vancouver	March 14, 1985	September 1, 1989
Dr. Julia Levy Vice President, Research and Development Quadra Logic Technologies Vancouver	January 7, 1988	October 20, 1990
Dr. Eric G. Manning Dean of Engineering University of Victoria	January 7, 1988	October 20, 1990
Mr. James R. McFarlane President International Submarine Engineering Ltd. Port Moody	January 7, 1988	September 1, 1988
Mr. Barry J. McMillan President J.S. McMillan Fisheries Ltd. Vancouver	October 20, 1988	February 23, 1989
Mr. Keith V.S. Meyer Vice President, Mining Cominco Engineering Services Ltd. Vancouver	March 3, 1989	September 1, 1989
Mr. Donovan F. Miller Corporate Director Vancouver	December 14, 1983	September 1, 1988
Dr. Kamlesh R. Patel Research Director AgriForest Technologies Ltd. Kelowna	January 7, 1988	September 1, 1988
Dr. George W. Poling Department of Mining and Mineral Process Engineering University of British Columbia	February 23, 1984	May 1, 1989

RESEARCH SECRETARIAT OF BRITISH COLUMBIA STAFF

Dr. Denis Connor	President (From May 1, 1988)
Dr. Jack Sample	Executive Director (to June 30, 1988)
Dr. Max Cairns	Acting Director (from July 1, 1988)
Mr. Curt Brown	Awards Officer (T.E.S.T.) (to July 13, 1988)
Ms. Susan Chambers	Awards Secretary (Science Council) (from October 31, 1988)
Ms. Tracy DeVito	Awards Secretary (Science Council) (to August 5, 1988)
Ms. Mary Eickhoff	Secretary (B.C.H.C.R.F.)
Ms. Kelly Hoekstra	Receptionist/Secretary
Ms. Louise Lamb	Secretary (SPARK) (from November 7, 1988)
Dr. ann lévi-lloyd	Policy Coordinator (from November 7, 1988)
Mr. Vincent Lum	Awards Officer (Science Council) (from December 12, 1988)
Mrs. Pauline McKeever	Secretary (Science Council)
Ms. Deb Seibold	Comptroller
Mr. Rick Warner	Awards Officer (Science Council)
Dr. Dick Whitney	Awards Officer (B.C.H.C.R.F.)
Ms. Jennifer Wolfe	Communications Assistant (from December 1, 1988)

ACTING DIRECTOR

Dr. Max Cairns

Ms. Susan Chambers

Ms. Mary Eickhoff

Ms. Kelly Hoekstra

Ms. Louise Lamb

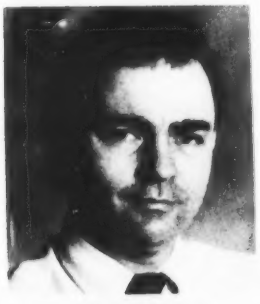
Dr. ann lévi-lloyd

Mr. Vincent Lum

Mrs. Pauline McKeever

Ms. Deb Seibold

Mr. Rick Warner



Dr. Dick Whitney

Ms. Jennifer Wolfe

FROM THE CHAIRMAN

Last October, at the B.C. Science and Engineering Awards Dinner, Premier Bill Vander Zalm released the details of the province's new science policy. The points of the new policy were, in summary:

1. Support the use and development of technological innovations that build on existing strengths and capabilities and that have export potential;
2. Encourage the use of science and technology to optimize the quality of life for British Columbians;
3. Recognize the importance of basic research, and encourage applied research;
4. Foster entrepreneurial enterprises and encourage partnerships among post-secondary institutions, government, industry and labour;
5. Support the development of marketing programs that take advantage of British Columbia's unique geographical and cultural make-up;
6. Strengthen the science and technology components at all levels of the educational system;
7. Encourage government, institutions, industry and labour to communicate the benefits of science and technology;
8. Make educational programs available in science and technology to enable retraining, upgrading and acquisition of new knowledge; and
9. Provide a level of direct government financial support for technology-intensive industries that will enable British Columbia to be competitive nationally and internationally.

Further details on the policy are contained in the pamphlet "Strategies for Innovation", available from the Ministry of Advanced Education and Job Training.

We were honoured that the Premier chose our annual awards dinner as the forum in which to announce the new policy. My colleagues and I on the Science Council of British Columbia support this policy wholeheartedly. And, of course, the Science Council has been asked to deliver and participate in many of the programs set up to ensure the objectives of this policy are realized.

To achieve these objectives will require an extraordinary effort from all of us. Fortunately, thanks to the leadership of our dynamic president, Denis Connor, and his enthusiastic staff, we have the elements in place to carry out the tasks set for us. The year described in this report has been unprecedented in terms of decisions and commitments made. The years ahead promise even more action and more achievement. We intend to make British Columbia's new science policy, science fact!

James A. McEwen
Chairman

THE YEAR IN REVIEW

New initiatives, new programs, new leadership, new members and staff, new directions, new challenges and new opportunities – it was that kind of year. Few could argue, then, that the period from April, 1988 to March, 1989 was the most dynamic 12 months for the Science Council of British Columbia since it was created by the provincial legislature back in 1978.

Here are some reasons why:

SPARK: Strategic Planning for Applied Research and Knowledge.

While the ongoing operation of the Science Council's grants, scholarships and fellowship programs occupied a significant amount of staff and volunteer time and energy, a good deal of fresh effort went into the preparation of the Spark Report entitled: *Science and Technology: Its Impact on the B.C. Economy: A 12-Year Plan.* The report was the culmination of many months of investigation and debate by a vast network of volunteer participants and professional consultants, all of whom believe that if the economy of British Columbia is to grow, and the people of the province to prosper, then a much wider application of science and technology must be achieved between now and the turn of the century.

The report, which was published in August, 1988, is unique in Canada, and is already being cited as a planning model for other Canadian jurisdictions. Not surprisingly, its preparation – and the forums and debates that preceded it – had the enthusiastic support and participation of the Premier's Advisory Council on Science and Technology, the B.C. Ministry of Advanced Education and Job Training and the B.C. Ministry of Regional Development; Industry, Science and Technology Canada and Western Economic Diversification Canada and the National Research Council of Canada. It brought together the recommendations and observations of people in economic sectors as diverse as Aquaculture and Fisheries, Biotechnology, Health Care, Energy, Mining, Agriculture and Food, Construction, Forests and Forest Products, Manufacturing and Machinery, Information Technology, Transportation and Superconductivity. In every sector, the participants in the process looked for situations where links could be forged between the various sectors, and where scientific, technological and entrepreneurial opportunities lay waiting. The report laid out major objectives, then listed the steps to be followed by government, industry and knowledge-based institutions in order to meet those objectives. The report was accepted by the Minister Responsible for Science and Technology in the provincial government, Stan Hagen, and in combination with the new science policy for British Columbia to develop positive action plans.

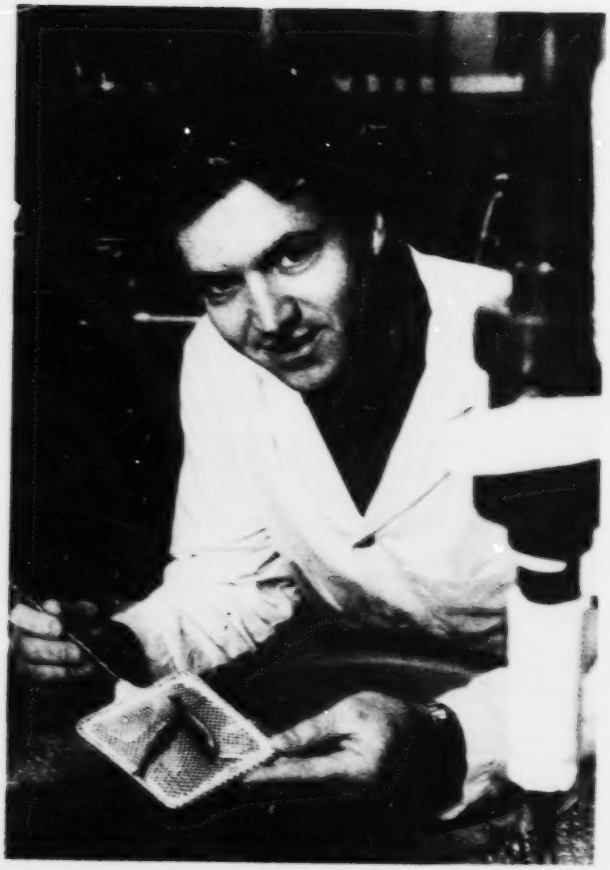
With the report in the public domain, the Science Council, through the SPARK initiative, began to install the ongoing infrastructure needed to ensure its implementation. An overall SPARK Coordinator, Ian Howard, was hired in December. Next, the job of finding full-time champions or coordinators for key sectors was started; several were on the job at the end of the fiscal year. Their job is to work with industry associations, government and other organizations to ensure that the recommendations put forward by the SPARK process are implemented.

GRANTS, SCHOLARSHIPS AND FELLOWSHIPS

A new $10 million Science and Technology Development Fund, set up in 1988 by the Ministry of Advanced Education and Job Training, provided additional funding for Science Council's traditional programs. Minister Stan Hagen announced that $2 million from the fund would be transferred to the Council to top up the AGAR (Assistance Grants for Applied Research) program.

The Ministry then held its own competition for support directly from the Fund, and asked the Science Council to use its active volunteer network of peer review sector committees to review the applications and rate them for support. This group responded magnificently. Then, in early March, Mr. Hagen announced that 69 British Columbia companies and organizations would share some $7.6 million in research grants from the Fund.

DR. MARK WINSTON, SFU Biological Sciences, AGAR recipient



WALTER HAJEN, UBC Animal Sciences,
GREAT Scholarship Winner

Meanwhile, two AGAR competitions took place in 1988-89, the 18th and 19th since the program began in 1979. Details of each are published elsewhere in this report.

The 1988 GREAT (Graduate Research, Engineering and Technology) scholarship winners were announced in July. Fifty-seven students at the three major British Columbia universities received up to $14,000 each to help pay the costs of their science or engineering graduate research. Names of the winners and their projects are included in the financial statements of this report.

In an effort to encourage private sector employment of men and women who have recently received doctorates in science or engineering, the Science Council established the Industrial Postdoctoral Fellowships. Worth $25,000 each, and renewable for a second year if progress is satisfactory, these fellowships have been a major factor in increasing the research and development expertise of small to medium-sized companies. In some cases, the fellowship winners have been the core around which firms have built a research department. In 1988-89, 12 fellowships were awarded; eight were new and four were second (final) year renewals.

The first three STARS (Science and Technology Awards for Returning Students) scholarships were also awarded in the 1988-89 fiscal year. These awards, worth $25,000 apiece, are intended to enable mature students who have been in the workforce for at least three years since their last graduation to return to university to complete graduate studies in science or engineering research.

Another program launched this year is MART, which stands for Market Assessment of Research and Technology. Funds from the federal-provincial Economic Regional Development Agreement are used to enable researchers at British Columbia universities, colleges and institutes to determine the market potential of their discoveries and technological innovations.

Yet another new program is the Health Development Fund. Established by the Science Council and the B.C. Health Care Research Foundation in early 1989, it will be administered jointly by the two organizations. The provincial government, through the Ministry of Health and the Ministry of Advanced Education and Job Training, has provided the fund with $2.85 million for its first competition. The Fund will be used to support health research projects which promise economic and/or health care benefits.

DR. SILVIA WESSEL, Newtec Industries, Burnaby,
Industrial Postdoctoral Fellow,

SCIENCE AND TECHNOLOGY EQUALS JOBS

Over 300 research projects have been assisted by Science Council funds in the past 10 years. The total value of those grants now exceeds $30 million. Has it been a good investment? To find out, the Science Council commissioned independent research consultant Dr. Craig Walden to investigate. Find out how they spent the money, he was asked. How many new products were created? How many new jobs? What sort of return did the provincial economy get for the Science Council's investment?

Dr. Walden found that 200 of the projects had been completed; the remaining 111 are either still in the research phase or are in the throes of being commercialized. And, of the 200 that were completed at the time of his study in 1988, 52 have resulted in commercial endeavours producing either real dollars of sales volume or savings in real dollars to industrial operations. The details of the report, together with some examples of the work supported, are contained in a new brochure "Science and Technology Equals Jobs", published by the Science Council in March, 1989. Free copies are available from the Science Council office.

The bottom line? A return of $16.88 for every Science Council/provincial government dollar invested through the AGAR program! It's the best investment a taxpayer could make!

DR. DONALD CALNE, Gold Medal Winner, Health Sciences

DR. B. STAFFAN LINDGREN, Phero Tech Inc., Vancouver, AGAR recipient

B.C. SCIENCE AND ENGINEERING AWARDS

These awards, established in 1980, proclaim the achievements of our outstanding scientists and engineers. The 1988 winners maintain the very high standard of the program. They are:

Dr. Donald Calne of the University of British Columbia Faculty of Medicine, winner in the Health Sciences category. Dr. Calne is recognized throughout the world for his pioneering work on certain mental disorders and, in particular, for his research and treatment relating to the muscular disease, dystonia.

Dr. Basil Peters and **Mr. Peter van der Gracht** of the Nexus Group of Companies, based in Burnaby, joint winners in Industrial Innovation. Their ingenuity and drive have, in a very few years, made the Nexus Group an international leader in commercial television and cable equipment and satellite receiving hardware.

Dr. Don VandenBerg of the University of Victoria Department of Physics and Astronomy, for Natural Sciences. Dr. VandenBerg's investigations into the ages of the globular star clusters that surround our galaxy and many others, have forced astronomers to adjust their estimates of the age of the universe.

DR. BASIL PETERS and MR. PETER van der GRACHT, Gold Medal Winners, Industrial Innovation

The winners were announced, and documentary profiles of them presented, on a one-hour special television presentation on the Knowledge Network in October. Then, a few days later, at a dinner in the Hotel Vancouver, they received their gold medals. Over 300 guests came to celebrate their achievements and to hear remarks from the Premier of British Columbia, the Honourable William Vander Zalm, the Honourable Stan Hagen, Minister Responsible for Science and Technology, and U.B.C. graduate Dr. Geraldine Kenney-Wallace, chairman of the Science Council of Canada.

REACHING OUT TO THE PROVINCE

It is customary for the Science Council to hold at least two of its monthly meetings each year outside the Lower Mainland. This enables a two-way exchange of information: Council members learn about the community's interests and concerns, while the community finds out more about Council programs and activities.

In April, 1988, Council members flew to Prince George. There they met with local business and political officials and toured a modern sawmill, pulp mill and the College of New Caledonia.

The site for the October Council meeting was Kelowna. Here, the emphasis was on small business and agriculture. Visits were paid to a tree seedling firm, a truck manufacturing company, a company that recoats photocopier drums, a fruit processing plant and an estate winery. A tour of Okanagan College was the highlight.

OPPORTUNITIES IN SPACE

The federal government has made a commitment to ensure that British Columbia companies and institutions receive at least 10 percent of the contract funds available from the Canadian Space program. Accordingly, at the request of the Minister Responsible for Science and Technology, Stan Hagen, the Science Council staged a one-day forum in November, entitled "Opportunities in Space".

DR. DON. VandenBERG, Gold Medal Winner, Natural Sciences

The forum brought officials from the Space program to Vancouver, so that they could explain what the opportunities for contracts were and how to go about submitting bids. Over 150 people attended. Since then smaller workshops on specific space initiatives have been planned. They will be held as part of the SPARK activity.

TRANSITION

Every year, a few Council members retire and new people are appointed to replace them. A similar transition is to be expected within the staff as well. But, 1988-89 saw an unusual amount of change.

In May, Dr. Denis Connor, who had been Science Council chairman, was designated the first president of the Science Council. His appointment was timed to coincide with the retirement of Dr. Jack Sample as executive director of the Research Secretariat. Associate director Dr. Max Cairns was made acting director, a position that's required pending passage through the legislature of changes to the Science Council Act. At that time, both the position of executive director and the Research Secretariat will be abolished. The staff will then be employed directly by the Science Council under the leadership of the president.

Mr. Tony French, Mr. Don Miller, Mr. Jim McFarlane, Mr. Barry McMillan and Dr. Kamlesh Patel left the Council during the year. They were replaced by Mr. Haig Farris, Dr. Otto Forgacs, Mr. Ian Greenwood and Mr. Keith Meyer. There was one vacancy as of March 31, 1989.

In addition to Dr. Connor as president, and Ian Howard, SPARK coordinator, others who joined the staff between April 1, 1988 and March 31, 1989 included Susan Chambers, awards secretary; Louise Lamb, SPARK secretary; Dr. ann lévi-lloyd, policy coordinator; Vincent Lum, awards officer; and Jennifer Wolfe, communications assistant.

SCIENCE COUNCIL OF B.C. –

Schedule of Assistance Grants for Applied Research (A.G.A.R.) Commitments for the year ended March 31, 1989

1. RESEARCH GRANT COMPETITION #18 (RC-18)

GRANT RECIPIENT & ORGANIZATION	PROJECT DESCRIPTION	TOTAL $ COMMITTED 1988-89
A. AGRICULTURE & FOOD		
Dr. R. Blair & Dr. B.D. Owen (UBC, Animal Science)	Improved productivity and health status of weanling pigs by enhancement of the immune function.	48,000
Dr. R. Rajamahendran (UBC, Animal Science)	Evaluation of cow side progesterone enzyme immunoassay as a means of improvement of reproductive performance in dairy cows.	36,074
B. AQUATIC RESOURCES		
Mr. R.E. Drew (Canadian Fishing Company, Vancouver) & Mr. D.A. Yip (Digicon Engineering, North Vancouver)	Development of an automated retort control and monitoring system for the salmon canning industry.	59,324
Dr. P.V. Fankboner (SFU, Biological Sciences)	Pearl culture in the Abalone *Haliotis kamstschatkana*.	29,961
Dr. W.A. Heath (Pioneer Aquafarms Ltd., Sidney)	A versatile, mechanized technology for shellfish culture in B.C.	40,000
Dr. D. O'Foighil (UVIC, Biology)	Enhancing juvenile survival in the scallop, *patinopecten yessoensis*.	27,000
Dr. R. Ring (UVIC, Biology)	Biocontrol of Eurasian water milfoil, *Myriophyllum spicatum*.	19,276
Dr. B.J. Skura (UBC, Food Science)	Evaluation of modified atmosphere packaging and storage at −8°C as an energy-efficient storage of farmed Coho and Chinook salmon.	45,000
Dr. P.M. Townsley & Dr. D.D. Kitts (UBC, Food Science)	Development and evaluation of serological assay for paralytic shellfish toxins in contaminated shellfish and crab.	40,000
C. BIOTECHNOLOGY		
Dr. R. Branion & Dr. K.V. Lo (UBC, Chemical Engineering & Bio-Resource Engineering)	Anaerobic/aerobic biological treatment and foam separation treatment of TMP/CTMP pulpmill wastewater for toxicity and BOD removal.	36,350
Dr. R.A. Lansman (Quadra Logic Technologies Inc., Vancouver)	Diagnosis of fish diseases.	66,884

1. RESEARCH GRANT COMPETITION #18 (RC-18) — *Continued*

GRANT RECIPIENT & ORGANIZATION	PROJECT DESCRIPTION	TOTAL $ COMMITTED 1988-89
D. COMPUTERS & COMPUTING		
Dr. G. Cooper (Glen Cooper & Associates, Vancouver)	"Stat XPRT"	25,000
Dr. S.J. Eady (Centre for Speech Technology Research, Victoria)	An automated system for computer-generated speech output.	45,000
Mr. G.M. Josin (Neural Systems Inc., Vancouver)	Neural systems turn-key robot products.	20,000
Dr. T.L. Richardson (Richardson Industries, Vancouver)	The development of a data acquisition and analysis system for brain research.	40,000
Dr. A.D. Russell & Dr. W.F. Caselton (UBC, Civil Engineering)	Construction productivity improvement using expert systems.	60,000
Dr. S.O.D. Russell (Synex Systems Corp., Vancouver)	User interface engineering computer programs.	40,000
E. ELECTRONICS & COMMUNICATIONS		
Dr. V. Cuperman (SFU, Engineering Science)	Low rate speech coding for mobile radio applications.	67,692
Mr. T.G. Foxall (Signum Systems Inc., Surrey)	Development of a digital signal processor (DSP) based data acquisition and analysis system.	80,000
Mr. J. McKay (TIAC Systems Inc., Port Moody)	A high speed, low cost image processing system - continuation and application demonstration.	98,800
Mr. R.S. Porter (E D T Manufacturing Ltd., Victoria)	Development of a DTMF coded ultrasonic remote controller using unpowered tone generators.	58,584
F. ENERGY		
Dr. D.F. Sheraton (Sheraton Manufacturing Ltd. West Vancouver)	The low pressure storage of natural gas for vehicles using adsorption.	40,000
Dr. A.E. Steck (BTC Membranes Inc., North Vancouver)	Development of a low-cost solid polymer electrolyte as an alternative to perfluorinated type membranes in fuel cells - phase II.	109,068
G. FORESTS & FOREST PRODUCTS		
Mr. M. Bakst (H.A. Simons, Vancouver)	Development of new design standards for prevention of structural steel corrosion in pulp & paper mills.	40,000
Dr. J. Brdicko & Mr. T. Bonac (Cetec Engineering Co., Vancouver)	High performance bandmill.	30,000
Mr. J.M. Ewart (F.E.R.I.C., Vancouver)	Stroke delimber merchandizer.	25,420

1. RESEARCH GRANT COMPETITION #18 (RC-18) — *Continued*

GRANT RECIPIENT & ORGANIZATION	PROJECT DESCRIPTION	TOTAL $ COMMITTED 1988-89
Dr. J.N. Owens (UVIC, Biology)	Increased cone and seed production in yellow cedar seed orchards.	34,100
Dr. D.R. Seip (UBC, Forestry)	Development of logging recommendations to protect caribou populations in central B.C.	10,000
Dr. R.M. Strang (B.C.I.T., Renewable Resources)	Prescribed burning in the Ponderosa pine/bunchgrass zone.	3,500
Dr. B.C.S. Sutton & Dr. Y. El-Kassaby (B.C. Research Corp., Vancouver)	Analysis of spruce hybrids using cytoplasmic DNA restriction fragment lengths.	41,800
Dr. J.M. Webster (SFU, Biological Sciences)	Use of recombinant DNA probes to identify the nematode complex affecting the forestry industry.	34,695
H. MANUFACTURING & MACHINERY		
Dr. S. Wessel (Newtec Industries Inc., North Vancouver)	Semiconductor gas sensors using sputter-coat techniques.	48,380
Mr. C.R. Bussani, Mr. G.F. Auchinleck & Dr. J.A. McEwen (Andronic Devices Ltd., Vancouver)	Development and evaluation of automated retraction systems for surgical procedures.	102,400
Dr. K. Colbow (SFU, Physics)	Selenium/Tellurium photoreceptors for photocopiers.	36,500
I. MINING, MINERALS & METALS		
Mr. D. Albon (Clayburn Industries Ltd., Abbotsford)	To evaluate used samples of the Clayburn carbon bake brick, developed with a Science Council grant, returned from Intalco Aluminum for test after scheduled periods in service.	40,000
Dr. K. Fletcher (UBC, Geological Sciences)	Exploration geochemistry of platinum and associated elements, southern British Columbia.	29,810
Dr. C.I. Godwin (UBC, Geological Sciences)	Optimization of exploration decisions by application of Galena Lead Isotope data in British Columbia.	27,980
Dr. K.W. Savigny (UBC, Geological Sciences)	Rock avalanche hazards affecting transportation corridors in south-western British Columbia.	8,000
	(RC-18) TOTAL $ COMMITTED 1988-89 (39 PROJECTS)	1,644,598

2. RESEARCH GRANT COMPETITION #19 (RC-19)

GRANT RECIPIENT & ORGANIZATION	PROJECT DESCRIPTION	TOTAL $ COMMITTED 1988-89
A. AGRICULTURE & FOOD		
Dr. G.C. Boffey (Royal Inland Hospital, Kamloops)	Isolation of the paralysing toxin produced by the Ixodid Tick *Dercamentor andersoni stiles* and to investigate the feasibility of the preparation of an anti-paralysing toxin antiserum.	13,890
Dr. T. Durance (UBC, Food Science)	Separation and recovery of bio-active substances from egg white.	33,000
Dr. L. Gilkeson (Applied Bio-Nomics Ltd., Sidney)	Commercial application of the predator, *Aphidoletes aphidimyza*, to control aphids in greenhouses and orchards.	18,000
Dr. A.D.M. Glass (UBC, Botany)	Silicate as an agent for the control of greenhouse crops.	35,000
Dr. D. Henderson (E.S. Cropconsult Ltd., Vancouver)	Development of practical field tests to identify bacterial ring rot and blackleg pathogens in pre-harvest potatoes.	26,000
Dr. M. Pitt (UBC, Agricultural Science)	Development of grazing management programs that optimize returns from livestock grazing and coniferous regeneration in the central interior of B.C.	12,104
Dr. J. Shelford (UBC, Animal Science)	Computerized dairy feed system.	43,000
Dr. M.L. Winston (SFU, Biological Sciences) & Dr. K.N. Slessor (SFU, Chemistry)	Development of commercial applications for honey bee (*Apis mellifera* L.) queen pheromone.	45,000
B. AQUATIC RESOURCES		
Mr. R. Baden (Ocean Gold Sea Farms, Barnfield)	Experimental cultivation of the blue mussel, *Mytilus Edulis*, using fishing web.	10,138
Dr. R.M. Beames (UBC, Animal Science)	Digestibility measurements in Pacific salmon.	34,110
Drs. H. Burt, K. McErlane & D. Kitts (UBC, Pharmaceutical Science & Food Science)	Development of HPLC methods for the measurement of antibiotics in salmonids.	80,000
Dr. B. Burton (B.C. Research Corp, Vancouver)	Measurement of antibiotic residues in farmed Pacific salmon.	60,000
Dr. R.D. Hudson (Applied Microsystems Ltd., Sidney)	Development of a new Dissolved Oxygen (DO2) Sensor.	31,700
Dr. F. Law (SFU, Biological Sciences)	A physiologically-based pharmacokinetic model of oxytetracycline in salmonids.	46,360
Prof. B.E. March (UBC, Animal Science)	Nutritional and feeding management strategies for maximization of amino acid utilization for protein synthesis (growth) by salmonids.	45,848
Dr. A. Rawicz (Andrew Engineering Inc., Burnaby)	Microprocessor controlled capacitive transducer for automatic fish inventory in fish farms.	40,000

C. BIOTECHNOLOGY

Dr. V. Lo & Dr. R. Beames (UBC, Bio-Resource Engineering)	Aerobic biological treatment and utilization of swine waste.	60,000

D. COMPUTERS & COMPUTING

Mr. K. Bailey (Pathfinder Software, Vancouver)	PowerHouse-based application utility software.	48,225
Mr. W. Baker (Tetrad Computer Applications Ltd., Vancouver)	Development of desktop demographic software, using Canadian census data, to create a geo-demographic model of the population.	54,000
Dr. R.D. Cameron (SFU, Computing Science)	Tools for program developers: A syntax based editor and the PICCOLO profiling system.	35,000
Dr. J. Dill (SFU, Engineering Science)	Computer aids in analysis and design of aesthetically pleasing geometric shapes.	43,700
Dr. R. Goldstein (UBC, Commerce)	A knowledge level database.	38,000
Mr. W. Kunz (KIS Information Systems, Vancouver)	The SMART manager: A computerized accounting system using artificial intelligence.	100,000
Dr. C. Love (SFU, Computer Science)	Computer-based training simulators for improved productivity.	28,000
Mr. G.W. Taylor (Transit Bridge Group Ltd., Victoria)	Expert software package for fully computerized design and drafting of steel logging bridges.	36,600
Dr. P. Voda (Complete Logic Systems, North Vancouver)	Logical completion of TRILOGY.	75,000

E. ELECTRONICS & COMMUNICATIONS

Dr. R.H.S. Hardy (SFU, Engineering Science)	Data communications over mobile radio: Performance evaluation from a network perspective.	63,500
Dr. C.A. Laszlo (UBC, Electrical Engineering)	Communication aids for the hearing impaired.	45,000
Dr. R. Orth (ALI Technologies Ltd., Burnaby)	Prototype development of a Computer Aided Tomographic (C.A.T.) breast imager.	100,000
Mr. R.F. Redden (Crystar Research Inc., Victoria)	Flux Crystal Growth Technology Development for Potassium Titanyl Phosphate (KTP), Yttrium Iron Garnate (YIG) and Beta Barium Borate (BBB) crystals.	43,000
Dr. B.G. Turrell (UBC, Physics)	Development of the Superheated Superconductivity Granule (SSG) detector.	50,000
Dr. S. Wessel (Newtec Industries Ltd., North Vancouver)	Liquid level monitor.	37,700

F. ENERGY

Dr. D.P. Romilly (UBC, Mechanical Engineering)	Assessment of inspection criteria and techniques for recertification of NGV on-board storage cylinders.	69,000
Mr. D.L. Russell (Dynamax Energy Corp., Vancouver)	Dynamax home natural gas compressor.	50,000

2. RESEARCH GRANT COMPETITION #19 (RC-19) — *Continued*

GRANT RECIPIENT & ORGANIZATION	PROJECT DESCRIPTION	TOTAL $ COMMITTED 1988-89
G. FORESTS & FOREST PRODUCTS		
Dr. T. Ballard (UBC, Soil Science)	Prescribed fire effects on sulphur in soil.	42,700
Dr. J.H. Borden (SFU, Biological Sciences)	Novel and refined semiochemical treatments for bark and timber beetles.	40,000
Dr. E. Camm (UBC, Forest Science)	Effect of cold soil temperature on root growth and recovery of photosynthesis in white spruce stored for various intervals.	26,000
Dr. J. Howard (B.C. Research Corp., Vancouver)	Applications of the by-products of the pulp and paper industry to enhanced oil recovery.	15,700
Dr. S.G. Hutton (UBC, Mechanical Engineering)	An investigation of the causes of washboarding in band and circular sawing.	14,000
Dr. P. Lawrence (UBC, Electrical Engineering)	Remote binocular vision for grapple yarding.	49,377
Dr. S. Lindgren (Phero Tech Inc., Vancouver)	Developing strategies and techniques for use of aggregation inhibiting semiochemicals of bark beetles.	40,000
Dr. K.L. Pinder (UBC, Chemical Engineering)	Chlorine dioxide production by direct sulphur reduction of sodium chlorate.	54,000
Dr. J. Thirgood (UBC, Forestry)	Establishment of an irrigated poplar plantation for disposal of sewage effluent.	69,624
H. MANUFACTURING & MACHINERY		
Dr. A. Poursartip & Dr. E. Teghtsoonian (UBC, Metals & Materials Engineering)	Optimized processing of composite materials.	70,000
Mr. C. Saunders (Shape Technologies, Vancouver)	Development of a CAD/CAM system for spinal orthotics.	60,000
Mr. B. Suggitt (Symbion Medical Ltd., Richmond)	Reducing patient risk with the mitroflow bioprosthesis.	50,000
Dr. G. Vickers (UVIC, Mechanical Engineering)	Computer aided lofting, fairing and manufacture in small shipyards.	45,000
Dr. C. Winter (Quantum Technology Corp., Surrey)	Development of a helium liquifier.	70,000
I. MINING, MINERALS & METALS		
Mr. J. Johns (Electro Alloy Technology, Richmond)	Research process chemistry and automation control of aluminum "strip mill" for continuous anodizing of long aluminum items.	69,037
Dr. A. Meisen (UBC, Applied Science)	Wet forming of sulphur.	41,200
Dr. H.V. Warren (UBC, Geological Science)	Thallium and selenium - pathfinder elements in exploration for hydro-thermal ore deposits in British Columbia.	26,256
	(RC-19) TOTAL $ COMMITTED 1988-89 (51 PROJECTS)	2,333,769

INDUSTRIAL POST DOCTORAL FELLOWSHIPS AWARDED 1988-1989

1. NEW AWARDS

Award Recipient	Discipline & Year of Graduation	Employing Company	$ Awarded
Dr. G. Birch	Electrical Engineering 1988	Regenesis Development Corp. North Vancouver	25,000
*Dr. N. Fortier	Physics 1986	CTF Systems Inc., Port Coquitlam	25,000
Dr. D.C.W. Hui	Solid State Physics 1989	TRL Microwave Technology Inc., Burnaby	25,000
Dr. S.R. Marandi	Space Dynamics 1988	MacDonald Dettwiler Associates Richmond	25,000
Dr. D. Renfrew	Botany-Phycology 1988	Agar Technologies, Vancouver	25,000
Dr. G. Thomas	Electrochemistry 1984	Moli Energy Ltd., Burnaby	25,000
Dr. H. Timmenga	Soil Biology 1987	B.C. Research Corp. Vancouver	25,000
Dr. A.R. Wardle	Entomology 1988	Monagro Consulting, Langley	25,000
		Subtotal (8 awards)	200,000

2. RENEWAL AWARDS

Award Recipient	Discipline & Year of Graduation	Employing Company	$ Awarded
Dr. N. Down	Aquatic Sciences, 1984	Quadra Logic Technologies Inc., Vancouver	25,000
Dr. D. Leclerc	Analytical Chemistry, 1985	PAPRICAN, Vancouver	25,000
Dr. L. Sojo	Analytical Chemistry 1988	CBR International Corp., Sidney	25,000
Dr. S. Wessel	Physics, 1988	Newtec Industries, North Vancouver	25,000
		Subtotal (4 awards)	100,000
		Total (12 awards)	300,000

*Previously held IPDF while at Corona Vacuum Coaters Inc. from August 1986 to July 1987.

G.R.E.A.T. SCHOLARSHIPS AWARDED 1988-89

1. NEW AWARDS (Competition GC-8)

Name of Student	University & Department(s)	Name(s) of Academic Supervisor(s)	Name(s) of Cooperating Organization(s)	$ Value
B. Allison	UBC, Microbiology	J.G. Levy	Quadra Logic Tech. Inc., Vancouver	14,000
P. Aubry	UVIC, Electrical Engineering	R. Vahldieck	TRL Microwave Tech. Inc., Burnaby	14,000
K. Baker	UVIC, Biology	R.A. Ring	Applied Bionomics Ltd., Sidney	14,000
N. Bepple	UBC, Oceanography	W. Hsieh	MacDonald Dettwiler & Associates, Richmond	14,000
D. Bruns	UVIC, Biology	J.N. Owens	1) B.C. Forest Products, Vancouver 2) Canadian Forestry Service, Victoria	7,500
D. Butler	UBC, Geophysics & Astronomy	T. Watanabe	B.C. Hydro Research & Development Ltd., Surrey	14,000
Y. Carriere	SFU, Biological Sciences	B.D. Roitberg	Agriculture Canada, Research Station, Summerland	9,667
E. Charter	UBC, Bio-Resource Engineering	K.V. Lo	Canadian Lysozyme Inc., Abbotsford	7,500
D. Corrigan	UBC, Mining & Mineral Process Engineering	A.L. Mular	Wright Engineers Ltd., Vancouver	6,500
S. Dehler	UBC, Geophysics & Astronomy	R.M. Clowes	Geological Survey of Canada, Vancouver	14,000
L. De Montigny	UBC, Forest Science	G.F. Weetman	Western Forest Products, Vancouver	14,000
J. Ens	UBC, Electrical Engineering	P. Lawrence	MacDonald Dettwiler & Associates, Richmond	6,500
J. Findlay	UBC, Electrical Engineering	J.A. McEwen & M.P. Beddoes	Vancouver General Hospital, Vancouver	6,500
B. Flinn	UBC, Botany	I.E.P. Taylor	B.C. Research Corp., Vancouver	14,000
W. Hajer	UBC, Animal Science	R.M. Beames	Dept. of Fisheries & Oceans, West Vancouver	7,500
J. Heal	UBC, Electrical Engineering	M.R. Ito	MacDonald Dettwiler & Associates, Richmond	6,500
C. Higgins	UBC, Zoology & Plant Science	J.H. Myers	1) Phero Tech Inc., Vancouver 2) Applied Bionomics Ltd., Sidney 3) B.C. Ministry of Agriculture & Fisheries, Abbotsford 4) Agriculture Canada, Agassiz 5) Yoder Canada, Burnaby	14,000
A. Hornby	UBC, Medical Genetics	W.R. McMaster	Quadra Logic Tech. Inc., Vancouver	14,000
F. Hovey	SFU, Biological Sciences	A.S. Harestad	Flathead Grizzly Bear Project, Marysville	7,500

R. Hudson	UBC, Forest Resource Management	D.L. Golding	Weyerhaeuser Canada Ltd., Okanagan Falls	14,000
L. Husted	UBC, Forest Sciences	D. Lavender	Canadian Forestry Service, Victoria	7,500
S. Johnson	SFU, Biological Sciences	J.G. Albright	1) Attwood Bay Fish Co., North Vancouver 2) Norweigan Enterprises Inc., Campbell River 3) B.C. Packers Ltd., Vancouver 4) Syndel Int. Inc., Vancouver 5) General Sea Harvest, Vancouver	14,000
M. Von Keyserlingk	UBC, Animal Science	J.A. Shelford	Ritchie-Smith Feeds Ltd., Abbotsford	7,500
A. Kot	UBC, Electrical Engineering	C. Leung	Mobile Info. Tech. Inc., Burnaby	6,165
O. Lee	UBC, Chemistry	A.P. Wade	PAPRICAN, Vancouver	14,000
I. MacRae	UVIC, Biology	R.A. Ring	Ministry of Environments & Parks, Victoria	14,000
J. Michaud	SFU, Biological Sciences	M. Mackauer	B.C. Honey Producers Assn., Vernon	14,000
D. Michelson	UBC, Electrical Engineering	E.V. Jull	Offshore Systems Ltd., North Vancouver	14,000
L. Nichol	UBC, Animal Science	D. Shackleton	Vancouver Public Aquarium, Vancouver	14,000
M. Peterson	UVIC, Geography	E.S. Tuller	Canadian Forestry Service, Victoria	7,500
L. Proctor	UVIC, Linguistics	J.F. Kess	Acquired Intelligence Inc., Victoria	14,000
H. Quesnel	UVIC, Biology	R.G. Allen	MacMillan Bloedel Ltd., Nanaimo	14,000
J. Quick	UBC, Mechanical Engineering	I.S. Gartshore	H.A. Simons Ltd., Vancouver	14,000
M. Reid	SFU, Biological Sciences	B.D. Roitberg	Pacific Forest Research Centre, Victoria	9,667
A. Roth	UBC, Soil Science	S. Berch	MacMillan Bloedel Ltd., Nanaimo	14,000
B. Scott	UBC, Zoology	C.J. Walters	Deep Sea Trawlers Assn of B.C., Surrey	14,000
B. Taylor	UBC, Zoology	Y.H. Carefoot	Dept. of Fisheries & Oceans, Nanaimo	14,000
D. Vickery	UBC, Botany	A.J.F. Griffiths	Quadra Logic Tech. Inc., Vancouver	7,500
			Subtotal (38 Awards)	433,499

2. RENEWAL AWARDS - Year 2 (Competition GC-8)

Name of Student	University & Department(s)	Name(s) of Academic Supervisor(s)	Name(s) of Cooperating Organization(s)	
D. Bates	SFU, Biological Sciences	B.A. McKeown	General Sea Harvest Corp., Vancouver	14,000
M. Breault	UBC, Mechanical & Electrical Engineering	M. Salcudean, D. Romilly & J. McEwen	Vancouver General Hospital, Vancouver	14,000
J.R. Brown	SFU, Biological Sciences	M.J. Smith & A.T. Beckenbach	1) Min. of Environment, Surrey 2) Pacific Aqua Foods Ltd., Vancouver	14,000
A. D'Iorio	UBC, Metals & Materials Eng.	D. Tromans	MacMillan Bloedel Research, Vancouver	14,000
S. Gamiet	UBC, Soil Science	S.M. Berch	B.C. Fruit Growers Assn., Kelowna	14,000
M. Gardiner	SFU, Biological Sciences	B.D. Roitberg	Agriculture Canada, Summerland	14,000
A. Gibb	UBC, Civil Engineering	W.K. Oldham	Dayon & Knight Ltd., Vancouver	14,000
B. Girard	UBC, Food Science	S. Nakai	Fisheries Council of B.C., Vancouver	14,000
S. McCrae	SFU, Biological Sciences	L.J. Albright	1) Aquarius Sea Farms Ltd., Vancouver 2) Hagensborg Resources Ltd., Vancouver 3) Hardy Sea Farms Inc., Vancouver 4) Pacific Aqua Foods Ltd., Vancouver 5) Royal Pacific Sea Farms Ltd., Vancouver 6) Seastar Resource Corp., Nanaimo	14,000
T. Miyamoto	UVIC, Linguistics	H.J. Warkentyne	Pacific Education Systems Corp., Victoria	14,000
L. Nikl	SFU, Biological Sciences	L.J. Albright	1) Aquarius Sea Farms Ltd., Vancouver 2) Hardy Sea Farms Inc., Vancouver 3) Pacific Aqua Foods Ltd., Vancouver 4) Royal Pacific Sea Farms Ltd., Vancouver 5) Seastar Resource Corp., Vancouver 6) Dept. Fisheries & Oceans, Nanaimo	14,000
D. Parker	UVIC, Dept. of Biology	N. Sherwood	General Sea Harvest Corp., Vancouver	14,000

RENEWAL AWARDS – Year 2 (Competition GC-8) – *Continued*

A. Stock	SFU, Biological Sciences	J.H. Borden	B.C. Forest Services, Smithers	14,000
C. Third	UBC, Metals & Mineral Engineering	F. Weinberg	Cominco Ltd., Trail	14,000
P. Thompson	UBC, Botany & Oceanography	P. Harrison	Aqua Foods Ltd., Vancouver	14,000
S. Urbanczyk	UVIC, Linguistics	H.J. Warkentyne	Centre for Speech Tech. Res., Victoria	14,000
			Subtotal (16 Awards)	224,000

3. RENEWAL AWARDS - Year 3 (Competition GC-8)

Name of Student	University & Department(s)	Name(s) of Academic Supervisor(s)	Name(s) of Cooperating Organization(s)	$ Value
W. Cicha	UBC, Chemistry	F. Aubke	Moli Energy Ltd., Burnaby	14,000
M. De Camillis	UBC, Zoology	H. Brock	Quadra Logic Tech. Inc., Vancouver	14,000
J. Taylor	UBC Mechanical Engineering	S. Hutton	Forintek Canada Corp., Vancouver	14,000
			Subtotal (3 Awards)	42,000
			Total (57 Awards)	699,499

The mission of the Science Council of British Columbia is to identify and encourage opportunities for economic development in British Columbia through the promotion of creative applications of science and technology.

THE SCIENCE COUNCIL OF
BRITISH COLUMBIA AND
SECRETARIAT ON SCIENCE,
RESEARCH AND DEVELOPMENT

FINANCIAL STATEMENTS

FOR THE YEAR ENDED
MARCH 31, 1989

AUDITORS' REPORT TO THE MINISTER OF ADVANCED EDUCATION AND JOB TRAINING

We have examined the balance sheet of The Science Council of British Columbia and Secretariat on Science, Research and Development as at March 31, 1989 and the statements of research receipts, expenditures and appropriations; T.E.S.T. receipts, expenditures and appropriations; operations receipts, expenditures and appropriations and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Council and Secretariat as at March 31, 1989 and the results of their operations and changes in their financial position for the year then ended in accordance with generally accepted accounting principles, as modified by note 2 to the financial statements, applied on a basis consistent with that of the preceding year.

Coopers & Lybrand

Vancouver, B.C.
May 19, 1989

BALANCE SHEET AS AT MARCH 31, 1989

	1989 $	1988 $
ASSETS		
CASH AND SHORT-TERM DEPOSITS (note 5)	11,925,020	3,007,343
ACCOUNTS RECEIVABLE	3,050,765	262,784
PREPAID EXPENSES	3,050	2,217
	14,978,835	3,272,344
LIABILITIES		
ACCOUNTS PAYABLE AND ACCRUED LIABILITIES	200,627	111,304
DEFERRED GRANTS (note 5)	100,678	
	301,305	111,304
APPROPRIATIONS		
RESEARCH (note 3)	14,617,449	2,941,025
TRAINING EMPLOYMENT IN SCIENCE AND TECHNOLOGY (T.E.S.T.) (note 4)		180,980
OPERATIONS	60,081	39,035
	14,677,530	3,161,040
	14,978,835	3,272,344

COMMITMENTS (Schedule 2 and notes 3 and 4)

APPROVED BY THE COUNCIL AND SECRETARIAT

STATEMENT OF RESEARCH RECEIPTS, EXPENDITURES AND APPROPRIATIONS FOR THE YEAR ENDED MARCH 31, 1989

	1989 $	1988 $
RESEARCH RECEIPTS		
Grants from the Province of British Columbia (Schedule 1)	15,641,394	3,500,000
Grants from the Government of Canada	100,000	100,000
Interest	299,003	250,161
Refunds of prior years' research expenditures	51,019	107,068
Other	34,912	13,730
	16,126,328	3,970,959
RESEARCH EXPENDITURES (Schedule 2)	4,189,904	3,632,995
EXCESS OF RECEIPTS OVER EXPENDITURES	11,936,424	337,964
RESEARCH APPROPRIATIONS – BEGINNING OF YEAR	2,941,025	2,603,061
TRANSFER TO OPERATIONS	(260,000)	
RESEARCH APPROPRIATIONS – END OF YEAR *(encumbered by outstanding commitments)* (note 3)	14,617,449	2,941,025

STATEMENT OF T.E.S.T. RECEIPTS, EXPENDITURES AND APPROPRIATIONS FOR THE YEAR ENDED MARCH 31, 1989

	1989 $	1988 $
T.E.S.T. RECEIPTS		
Grants from the Province of British Columbia		382,171
Grants from the Government of Canada		60,071
Interest income	1,065	23,031
	1,065	465,273
T.E.S.T. EXPENDITURES (GRANTS)	180,310	481,749
T.E.S.T. EXPENDITURES (OPERATIONS)		
Administration and accounting		8,587
Courier, communications and travel		1,241
Non-recoverable costs	1,735	
Rent		5,856
Salaries and employee benefits		38,071
Utilities and supplies		872
	182,045	536,376
DEFICIENCY OF RECEIPTS OVER EXPENDITURES	(180,980)	(71,103)
T.E.S.T. APPROPRIATIONS – BEGINNING OF YEAR	180,980	252,083
T.E.S.T. APPROPRIATIONS – END OF YEAR *(encumbered by outstanding commitments)* (note 4)	Nil	180,980

THE SCIENCE COUNCIL OF BRITISH COLUMBIA
AND SECRETARIAT ON SCIENCE, RESEARCH AND DEVELOPMENT

STATEMENT OF OPERATIONS RECEIPTS, EXPENDITURES AND APPROPRIATIONS FOR THE YEAR ENDED MARCH 31, 1989

	1989 $	1988 $
OPERATIONS RECEIPTS		
Grants from the Province of British Columbia	300,000	300,000
Interest	8,420	12,906
Recoveries –		
Advanced Systems Foundation	22,108	4,071
British Columbia Health Care Research Foundation	143,421	120,629
Other	25,651	
Training Employment in Science and Technology		54,627
	499,600	492,233
EXPENDITURES		
Computer consultants	2,555	
Computer services	7,611	2,707
Consulting and temporary staff	21,164	3,865
Furniture and equipment (note 5)	120,223	4,108
Leasehold improvements	1,905	467
Meetings	5,754	9,214
Non-recoverable costs	8,130	
Personnel – recruitment		36,158
Photocopying and printing	42,685	31,944
Postage and courier	22,422	18,937
Professional fees	15,989	5,669
Publications	3,197	2,362
Rent	60,705	54,660
Salaries and employee benefits	357,748	317,465
Stationery and supplies	10,555	3,773
Telephone	19,707	16,287
Travel	38,204	15,154
	738,554	522,770
DEFICIENCY OF RECEIPTS OVER EXPENDITURES	(238,954)	(30,537)
OPERATIONS APPROPRIATIONS – BEGINNING OF YEAR	39,035	69,572
TRANSFER FROM RESEARCH	260,000	
OPERATIONS APPROPRIATIONS – END OF YEAR	60,081	39,035

STATEMENT OF CHANGES IN FINANCIAL POSITION
FOR THE YEAR ENDED MARCH 31, 1989

	1989 $	1988 $
CASH PROVIDED FROM (USED FOR)		
OPERATING ACTIVITIES		
Excess of receipts over disbursements –		
Research	11,676,424	337,964
T.E.S.T.	(180,980)	(71,103)
Operations	21,046	(30,537)
Change in non-cash working capital	(2,598,813)	(214,669)
INCREASE IN CASH	8,917,677	21,655
CASH AND SHORT-TERM DEPOSITS – BEGINNING OF YEAR	3,007,343	2,985,688
CASH AND SHORT-TERM DEPOSITS – END OF YEAR	11,925,020	3,007,343

NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED MARCH 31, 1989

1. ORGANIZATION

The Science Council of British Columbia and Secretariat on Science, Research and Development were established in June 1978 under the Science Council of British Columbia Act. Significant changes to the Act are expected shortly.

2. ACCOUNTING POLICIES

Basis of Accounting for Receipts and Expenses

Grants from the Province of British Columbia are accounted for as receipts in the calendar year to which they relate. Full provision is made for all accrued liabilities except that outstanding research grant commitments, which are conditional on receipt of satisfactory progress reports, are not recorded until actually disbursed.

Fixed Assets

Fixed assets are not capitalized and depreciated as assets of the Council and Secretariat, but are written off in the period in which they are purchased.

3. RESEARCH GRANT COMMITMENTS (Schedule 2)

During the year, the Council approved funding for research projects, IPDFs, GREAT's, Science and Engineering awards, special requests, special projects, honoraria and other expenses totalling $14,725,454. At March 31, 1989, known outstanding commitments totalled $13,231,449 which, together with additional estimated renewed commitments for the year ending March 31, 1990 of $2,203,442, amount to $15,434,891 in known and estimated outstanding commitments.

The Ministry of Advanced Education and Job Training announced the Science and Technology Development Fund program during the year. The administration of awards under this program has been contracted to the Science Council. The funds for this program to be received by the Council are $8,035,554 plus interest (see note 4) with a total of $8,297,877 being committed for disbursements during subsequent periods.

4. TRAINING EMPLOYMENT IN SCIENCE AND TECHNOLOGY

The program is a joint federally and provincially funded incentive program whereby financial assistance is available to firms and corporations that hire post-secondary graduates in the fields of science, engineering and technology. It is administered by the Secretariat under contract to the B.C. Ministry of Advanced Education and Job Training, and Employment and Immigration Canada.

Federal funding for this program ended March 31, 1988, but operations continued until all committed funds were disbursed in July 1988. Provincial funding was available but the program was postponed until a study for its need can be performed. These provincial funds were transferred, with Ministry approval, to other programs.

5. OTHER INFORMATION

(a) A new computer system has been purchased for approximately $125,000, which is included in payables at year end.

(b) Cash and short-term deposits include $7,477,281 of Science and Technology Development Funds received March 31, 1989.

(c) Deferred grants include $100,000 from the National Research Council as recovery for 1989/90 S.P.A.R.K. operations.

SCHEDULE OF RECEIPTS FROM THE PROVINCE OF BRITISH COLUMBIA FOR THE YEAR ENDED MARCH 31, 1989

	1989 $	1988 $
Provincial Research Grant	4,000,000	3,500,000
Provincial Grants: MART	166,975	
HDF	1,438,865	
STDF I	2,000,000	
STDF II	8,035,554	
	15,641,394	3,500,000

SCHEDULE OF COMMITMENTS AND DISBURSEMENTS OF SCIENCE COUNCIL RESEARCH GRANTS FOR THE YEAR ENDED MARCH 31, 1989

	Known outstanding commitments - beginning of year	Additional commitments during year	Commitment reductions during year	Disbursed during year	Known outstanding commitments end of year	Estimated renewed commitments 1989 - 1990	Known and estimated outstanding commitments at March 31, 1989
RESEARCH GRANTS	$	$	$	$	$	$	$
Research Competition #6	7,970		(7,970)				
Research Competition #9	5,465			5,465			
Research Competition #10	982			982			
Research Competition #12	33,380		(771)	9,464	23,145		23,145
Research Competition #13	122,608		(77,197)	11,154	34,257		34,257
Research Competition #14	91,443		(3,129)	72,348	15,966		15,966
Research Competition #15	168,227		(11,936)	129,213	27,078		27,078
Research Competition #16	617,073	14,123		442,371	188,825		188,825
Research Competition #17	1,466,209		(32,000)	1,009,031	425,178		425,178
Research Competition #18		1,644,598		726,335	918,263	772,442	1,690,705
Research Competition #19		2,333,769		75,749	2,258,020	1,256,000	3,514,020
	2,513,357	3,992,490	(133,003)	2,482,112	3,890,732	2,028,442	5,919,174
IPDF	131,250	300,000	(3,125)	221,875	206,250	175,000	381,250
GREAT							
GC8		699,499		699,499			
GC9		450,000			450,000		450,000
		1,149,499		699,499	450,000		450,000
STARS	50,000	125,000		50,000	125,000		125,000
STDF II		8,297,877			8,297,877		8,297,877
SCIENCE AND ENGINEERING AWARDS		38,170		38,170			
SPECIAL REQUESTS							
Arts, Science and Technology Centre - Director	30,000			30,000			
Arts, Science and Technology Centre - Regional Science Fairs 1988	2,100			2,100			
Arts, Science and Technology Centre - Regional Science Fairs 1989		33,450		18,900	14,550		14,550
B.C.S.T.A./F.I.S.A. Book Prize 1988	5,995		(3,760)	2,235			
B.C.S.T.A./F.I.S.A. Book Prize 1989		10,500		1,000	9,500		9,500
Superconductivity Research	5,000			5,000			
T.V. Science Show '87 (Pearl Productions)	1,000				1,000		1,000
Science talks	240			240			
CCCT - Shad Valley 1988		6,600		6,600			
Physics Day Project		1,000		900	100		100
Stellar Motion		5,000			5,000		5,000
	44,335	56,550	(3,760)	66,975	30,150		30,150
SPECIAL PROJECTS							
Leadership		104,420		104,420			
A.G.A.R. Program Review Project	3,900	4,353		8,253			
Public Information		106,179		106,179			
Patent Policies Review		5,000			5,000		5,000
B.E.S.T.		45,000		20,000	25,000		25,000
T.E.S.T. Study		10,000			10,000		10,000
Opportunities in Space Forum		33,859		33,859			
	3,900	308,811		272,711	40,000		40,000
STRATEGIC PLANNING FOR APPLIED RESEARCH AND KNOWLEDGE (S.P.A.R.K.)	87,707	450,396	5,238	351,901	191,440		191,440
HONORARIA AND OTHER EXPENSES		6,661		6,661			
	2,830,549	14,725,454	(134,650)	4,189,904	13,231,449	2,203,442	15,434,891